





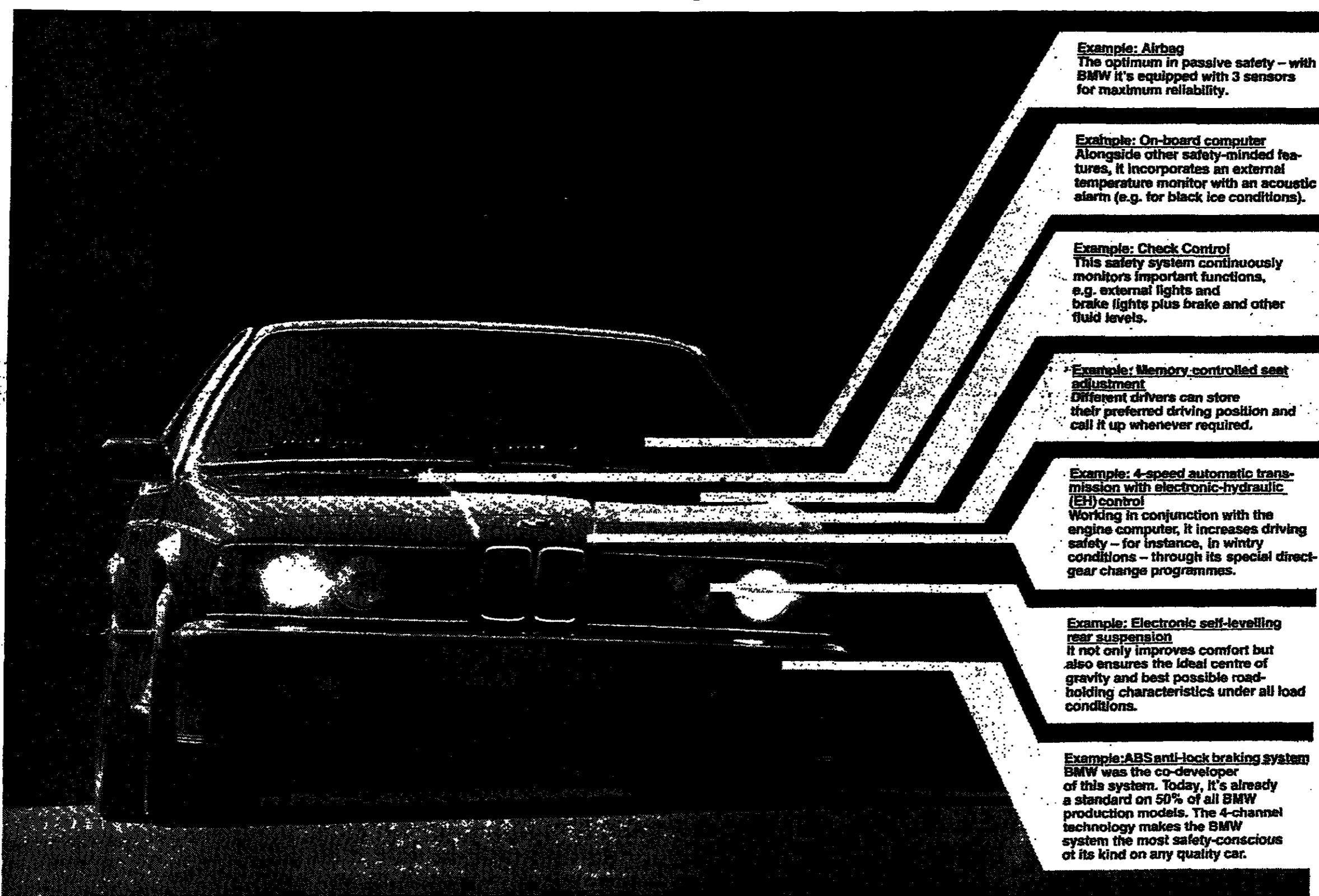




inveiled  
f quality  
paper

## 10 Years of BMW safety electronics.

A technological lead  
that offers everyone something.  
And BMW drivers everything.



**Example: Airbag**  
The optimum in passive safety – with BMW it's equipped with 3 sensors for maximum reliability.

**Example: On-board computer**  
Alongside other safety-minded features, it incorporates an external temperature monitor with an acoustic alarm (e.g. for black ice conditions).

**Example: Check Control**  
This safety system continuously monitors important functions, e.g. external lights and brake lights plus brake and other fluid levels.

**Example: Memory-controlled seat adjustment**  
Different drivers can store their preferred driving position and call it up whenever required.

**Example: 4-speed automatic transmission with electronic-hydraulic (EH) control**  
Working in conjunction with the engine computer, it increases driving safety – for instance, in wintry conditions – through its special direct-gear change programmes.

**Example: Electronic self-levelling rear suspension**  
It not only improves comfort but also ensures the ideal centre of gravity and best possible road-holding characteristics under all load conditions.

**Example: ABS anti-lock braking system**  
BMW was the co-developer of this system. Today, it's already a standard on 50% of all BMW production models. The 4-channel technology makes the BMW system the most safety-conscious of its kind on any quality car.

"Electronics are the driving force of automotive development" and "Progress at the IAA (International Auto-Fair, Frankfurt) comes substantially out of the computer" – two examples (Süddeutsche Zeitung, issue 212/85) that are typical of the press coverage of this year's international motoring exhibition in Frankfurt. And further evidence of how BMW, as the pioneer of electronics, has provided automotive progress with all its most decisive impulses over the past decade.

**Anyone interested in progress in car safety will quickly discover one fact: more safety means more electronics. And BMW is the leader in electronics.**

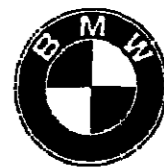
BMW wasn't simply the first manufacturer to appreciate the fundamental significance of electronics for the future of the quality car. From as far back as 1975, BMW has also consistently exploited this farsighted technology in solving complex technical problems. And this lead in know-how doesn't just prove its value in engine electronics or monitoring, warning and information systems. BMW drivers also enjoy the far-reaching advantages of electronics when it comes to safety.

As a direct result of its unrivalled experience in this whole area, BMW is also able to solve new problems more quickly and more reliably. One example of this is sensor technology, where electronics are used to relay vital information governing numerous mechanical and thermal operations.

Without the exceptional reliability of this sensor technology, many important safety-related features would be inconceivable. By consistently and comprehensively introducing electronics in its standard model line-up, BMW has led the way to major breakthroughs in this all-important technological field. And with such success that drivers of other makes of car are slowly beginning to enjoy, here and there, some of the advantages of automotive electronics. But if you really want to enjoy right now all the benefits of something, which for many is still even today a distant star on the horizon, then there's only one way. It's called choosing BMW.

BMW cars. The BMW range of fine automobiles: the ultimate in performance, comfort and safety.

BMW AG, Munich

















## TECHNOLOGY

## Nuclear plant for high power in space

David Fishlock on a scheme that may replace solar cells

A FAST reactor that converts its heat directly into electricity by thermoelectric converters will be ordered by the US Government next summer. It will be built at the Hanford Engineering Development Laboratory near Richland, Washington state, to a conceptual design submitted by US General Electric.

If successfully built and demonstrated, say proponents of the project, a reactor of the same design could be orbiting the earth within about five years. The SP-100 project will test a concept expected to provide as much as a megawatt of power in space, for example to drive a beam weapon.

The SP-100 is a tripartite space power project, involving the Pentagon, the Energy Department and the National Aeronautics and Space Administration, to develop a new source of power for space. Already some demands have begun to outstrip the potential of the solar-cell systems which have powered most space missions. The areas required are too large and solar systems are unsatisfactory for large bolts of electrical power—pulsed power. Such bursts of power are required for advanced radars as well as new weapon systems.

But several civil space missions are emerging which also need the kind of power only a reactor can deliver, including proposals for air traffic control and communications in space.

The SP-100 project was launched in 1983. It was first funded by the Defense Advanced Research Projects Agency, the Pentagon's research arm, then transferred to the Strategic Defence Initiative Organisation (SDIO), the Star Wars agency. The project office, run by Dr Vincent Truscillo, is at the Jet Propulsion Laboratory in Pasadena, California.

The goal of SP-100 is a power-plant that will run unattended in orbit for between seven and 10 years, and can be launched as a single space shuttle load. The conceptual design to be built as a ground-based demonstrator at Hanford has been picked from a short list of three.

It was picked as the one

which could be flying inside five years, says Jim Scott at Los Alamos National Laboratory, deputy project manager responsible for nuclear operations. He has hopes that by 1988 the SDIO will be sufficiently convinced to order the first flight model, before the ground model is finished.

All three system concepts short listed are based on the same reactor—a fast reactor cooled by liquid metal, with a refractory fuel running at higher temperature than the big European 'fast' reactors in France and Britain. The big difference is in the way each converts heat to electric power. Martin Marietta and GE Technologies joined in proposing a thermionic converter, built into the reactor core. Rockwell International proposed a Stirling cycle engine, potentially of much higher efficiency than the other schemes. GE proposed a thermoelectric system—the only one of the three for which there is previous space experience.

The winning concept resembles an umbrella, with the reactor forming the ferrule, behind which a large area of radiator surface opens to dump its waste heat in space.

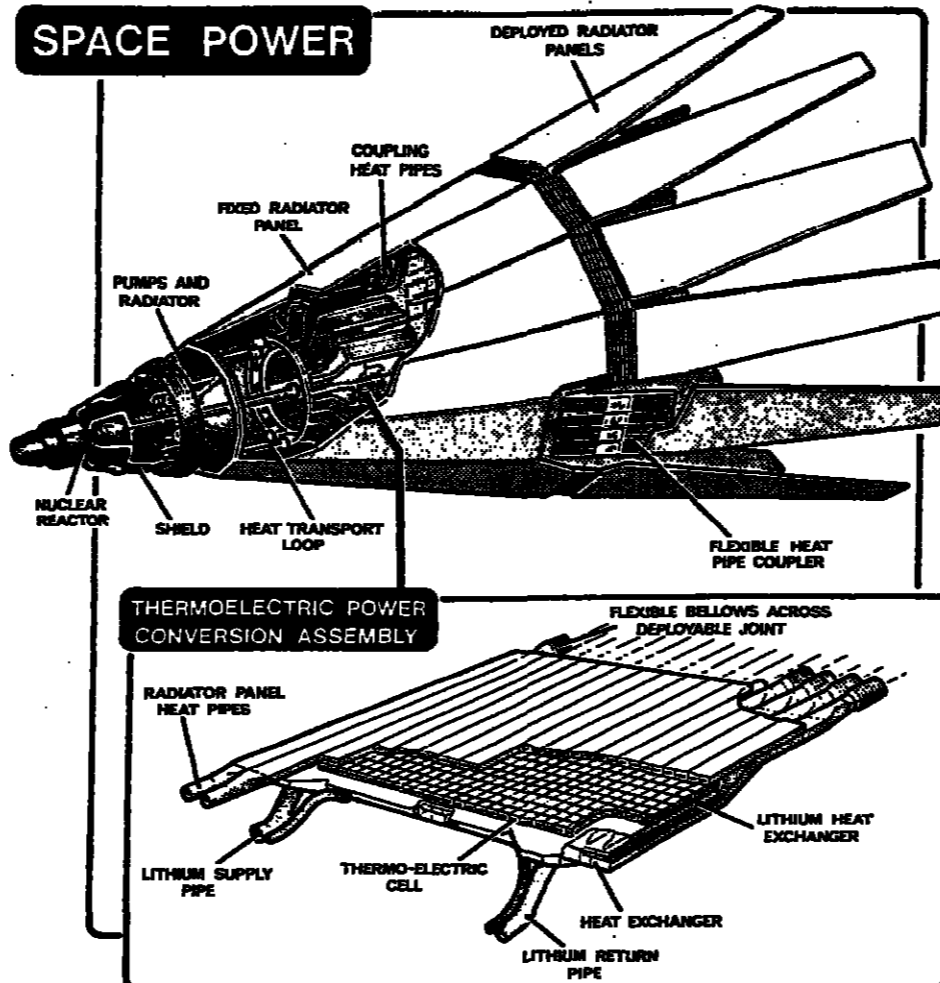
The reactor is less than one cubic metre in volume. It will be built of heat-resistant niobium-zirconium alloy and fuelled with highly-enriched uranium nitride fuel operating at up to 1,100 deg C. The fuel has been under test in the EBR-II experimental fast reactor for the past year.

The reactor coolant will be molten lithium metal. Lithium, with its lower vapour pressure, will be lighter than such coolants as sodium, used in ground-based fast reactors. The project team believes it will be possible to start up a lithium-cooled reactor in space with the coolant frozen solid in the core and converter.

Between the reactor and its thermoelectric converters will be a shadow shield to screen the electronics from radiation.

The SP-100 project has just entered its second phase with

## SPACE POWER



the choice of both concept and site for a ground engineering system. The project team expects to choose the contractor—not necessarily GE—by June 1986, for construction to begin in August. The reactor will be tested under simulated space conditions in a vacuum chamber, running at full power. The target date for "criticality" of the reactor is late 1990.

SP-100 began as a concept for 100 kw of space power. The current target is 300 kw. But Jim Scott believes the chosen system has considerable development potential. "We believe it can grow with minor modifications to 900 kw—even 1.2 megawatts—for a single shuttle load."

Each cell, as shown in the sketch, contains 25 thermocouples metallurgically bonded into a compact assembly. About 8,000 of these cells would be needed at present to generate 100 kw of electricity. The couples are silicon-germanium with gallium phosphide to boost the efficiency.

But GE has embarked on a development programme to increase conversion efficiency by a factor of two and to reduce the cell size by a factor

of 20 or more. Mechanically, this system will require extensive testing to ensure that the large thermal gradients do not tear the cells apart over a seven to 10-year lifespan without maintenance.

Molten lithium coolant will be circulated through these cells by self-starting coolant pumps, driven electro-magnetically by power provided by the thermocouples.

Physically the biggest feature of the GE system is the umbrella-like waste heat radiator. Even for a 100kw system this radiator would need a surface area of about 50 square metres and would be over 5 metres long. Embedded in the radiator are hundreds of long heat pipes, with flexible couplings to allow the individual panels to flower when the system is deployed in space.

THE thermoelectric principle of converting heat directly into electricity, without moving parts, relies on a temperature difference between two legs of a thermocouple. US General Electric has devised a compact thermocouple package for use with molten lithium, which it hopes can be mass-produced as modules, called cells.

## Oil 'home laundry' eases cash flow

THE DAYS are long gone when industry could afford to throw away used lubricants, and most large oil companies now offer a recycling service to their customers.

However, Esso has taken this a stage further by loaning machinery to customers for the purpose.

A customer has to have a contract with Esso for lubricants before it will introduce the machinery, and has to be using in the region of 50,000 litres a year to make it worthwhile.

Wellworthy, which makes parts for diesel engines was the first company to benefit. It uses cutting oils for machining pistons from aluminium blocks. Metal chips and shavings were removed from the cutting oils by filters and strippers but, gradually, the oils became loaded with fine particles which could not be removed.

The oil itself was in good condition, but once the particles were in suspension, the company had problems maintaining the required mirror finish on the pistons.

It would send the oils to a specialist launderer, but this was expensive, time consuming and had to be done frequently. There was considerable loss and some doubt that the oil returned would be of the required quality.

Now the oil is heated to 170-180° F, so lowering the oil's viscosity and letting the particles settle out more easily. Then it is put through a high performance centrifuge. Everything with a specific gravity greater than one, including most metallic fines, comes out of suspension, and the oil can then be re-used.

Esso lent several additional storage and settling tanks of 2,500 litres capacity to keep dirty and clean oils separate, and to allow for settling.

Esso says between two and three litres of lubricant can flow through every minute. Some companies could pay back on the installation in two to three months. To use a laundering company for recycling oils can cost up to 20p per litre.

The costs of operating the centrifuge are 0.85p per litre, including the power required, and it can be overseen by an unskilled operator.

Wellworthy is saving \$25,000 a year. It has five factories,

but initially it was recycling oil only from its Bridgewater factory. It now uses flat-bed lorries carrying components to its other plants to transfer oil in stackable tanks containing 1,500 litres each to Bridgewater for recycling.

Esso supplied the tanks, and advises operators on checking the quality of oil as it emerges from the centrifuge.

Wellworthy also centrifuges its hydraulic oils, although the contamination results more from chemical contamination than the mainly physical pollution of cutting oils. There is a gradual build-up of oxidation products, which can lead to the formation of acids and consequent corrosion and visual darkening of the oil.

Over lengthy periods, additives can be depleted. Wellworthy found that hydraulic oil could be effectively clarified by centrifuging after experimenting with temperature control, flow rates and monitoring techniques.

However, to restore the centrifugal oil to something like its original quality, the depleted additive has to be replaced by blending in new hydraulic oil. Esso provided Wellworthy with instruments to measure the insoluble content of the original oil and its viscosity, to indicate when it needs to be laundered, and to show when the oil is of the desired quality.

Wellworthy has recently started to recycle soluble oil using machinery supplied by the oil company. The contaminated oil is allowed to settle in a storage tank, so that a water layer separates out. Where a stable emulsion has formed, the oil is routed through a centrifuge to remove particulate matter, while the water is treated and drained off. The oil can then be burnt in a boiler.

It cannot be used again in machinery, because the chemical treatment used to split the oil and water destroys the additives.

Esso says lubricants represent 3 per cent of total crude oil production. Extending their life could make a significant contribution to expected savings first outlined in the Joint report on lubricants in 1984. The report estimated that in excess of \$500m per annum could be saved by improvements in education and research in tribology.

ALISTAIR GUILD

Look at Lovell  
FOR REBURISHMENT

## Consortium seeks uses for ceramic

A CONSORTIUM of five companies is trying to find applications in the electronics, car and domestic goods industries for a new type of ceramic material.

The new ceramic, Kerallor, is based on a fine powder of glass made to a specific and undisclosed formulation. The powder is then applied to the surface of a stainless steel plate in a process akin to screen printing.

In a technique which needs a temperature of about 1,000 deg C, the glaze is converted to a crystalline ceramic. The metal and ceramic combined gives a good base for thick-film and hybrid devices made by semiconductor companies.

The partners in the consortium think further applications for the product could follow in the area of electronic components for cars, such as engine temperature sensors, and parts such as tough ceramic hobs for cookers.

The groups in the consortium are Thorn EMI, Lucas Englehard (the precious-metals producer), Wade Potteries of Stoke and Ceramic Developments, a small company in Cury.

## Typewriter improver

OLIVETTI HAS introduced an upgrade unit for its typewriters that will turn them into a videotyping system with word processing.

For £2,055, users are provided with a single 3.5 in disk drive and a stand-alone screen which can be positioned to suit the operator. Use of the system can be learned in a few hours by a competent typist, Olivetti claims.

The system, known as ETV350, is also available with a dual disk drive at £2,375. More on 01 785 6866.

CALCINED COKE  
FROM

ARCO



Consistent Quality Carbon

Arco Export Trading Inc.  
A Subsidiary of Atlantic Richfield Company

For Information telex 677415  
Attn: J.F. Zink



## BANK OF AMERICA NT &amp; SA. ECONOMICS DEPARTMENT, LONDON

areas. All rates quoted are indicative. They are not based on, and are not intended to be used as a basis for, particular transactions. Bank of America NT & SA does not undertake to trade in all listed foreign currencies, and neither Bank of America NT & SA nor the Financial Times assume responsibility for errors.

ECU=\$US5.871196      SDR1=\$US1.08829  
Sibor as of December 25 at 11.00 a.m.  
3 months: 8      6 months: 8

## AUTHORISED UNIT TRUSTS

[illegible]

programme, and will be completed in 1987 in time for the live broadcast of the opening ceremony of the Parliament Building.

★

Acco Process is investing £1.25m in DEC VAX-based computer systems, including order processing and on-line distribution management warehouse management system, and GL Eleven, a graphics and terminal data pull-down packaged software.

Design is worth over £2m and delivery of the first contract, designated DCH, is scheduled for 1987. As well as accepting inputs from the submarine's own computers, the system will use 25M sqm suite of fibre to totally integrated combat system. The console can be linked through a video switching unit, enabling any three displays either AIO or sonar information. The system includes a contact evaluation plot, which will provide a picture of contacts and own ship's movements.

[illegible]

Manufacturers Life Insurance Co (UK) Property Growth Assur Co Ltd  
0432 254101 Longthorpe, Crendon CN9 1LU 01493

هكذا من الأهل

[illegible][illegible]



INDUSTRIAL Friday December 27 1985

**"Recent Issues" and "Rights" Page 16  
(International Edition Page 20)**



## Indices

**NEW YORK**

**DOW JONES**

i

• •

1985										Since Comp'n		1985			
Dec. 84	Dec. 83	Dec. 80	Dec. 78	Dec. 76	High	Low	High	Low	High	Low	High	Low			
Industry's	1519.18	15288.78	1543.00	1545.82	1548.43	1563.10	1118.86	1583.17	-41.22						
Home Bldg.	83.56	83.55	83.57	83.57	83.80	83.56	78.74								
Transport.	698.58	708.25	711.26	713.37	716.29	723.31	553.03	723.51	12.32						
Utilities	178.19	173.28	174.96	175.37	175.63	174.96	164.58	175.53	10.5						
Trading Vol	76,500	107,889	170,870	133,277	137,380										
1984's High	1535.45	(1947.84)													
Low	1508.83	(1916.63)													
Industrial dividend yield %	Dec. 20	Dec. 13	Dec. 8	Dec. 6	year ago	(approx)									
	4.12	4.12	4.28		4.69										
STANDARD AND POORS															
Dec. 84	Dec. 83	Dec. 80	Dec. 78	Dec. 76	High	Low	High	Low	High	Low	High	Low			
Industrials	230.12	231.60	234.17	233.38	232.78	235.70	188.24	235.75	5.68						
Composite	207.14	208.57	210.94	210.02	209.81	212.02	163.68	212.02	4.81						
Industrial dividend yield	3.41	3.48	3.50		4.09										
Industrial P/E ratio	14.77	14.00	15.91		10.43										
Long Gov. Bond yield	9.33	9.45	9.84		11.20										
N.Y.S.E. ALL COMMON															
1986				1985				Since Comp'n							
Dec. 84	Dec. 83	Dec. 80	Dec. 78	Dec. 76	High	Low	High	Low	High	Low	High	Low			
Issues Traded	1,975	3,060	2,048												
Rises	590	192	1,100												
Advances	964	1,187													
Unchanged	585	381	346												
New Highs	100	20	6												
Dec. 84 <td>Dec. 83 <td>Dec. 80 <td>Dec. 78 <td>Dec. 76 <td>High <td>Low <td>High <td>Low <td>High <td>Low <td>High <td>Low </td></td></td></td></td></td></td></td></td></td></td></td>	Dec. 83 <td>Dec. 80 <td>Dec. 78 <td>Dec. 76 <td>High <td>Low <td>High <td>Low <td>High <td>Low <td>High <td>Low </td></td></td></td></td></td></td></td></td></td></td>	Dec. 80 <td>Dec. 78 <td>Dec. 76 <td>High <td>Low <td>High <td>Low <td>High <td>Low <td>High <td>Low </td></td></td></td></td></td></td></td></td></td>	Dec. 78 <td>Dec. 76 <td>High <td>Low <td>High <td>Low <td>High <td>Low <td>High <td>Low </td></td></td></td></td></td></td></td></td>	Dec. 76 <td>High <td>Low <td>High <td>Low <td>High <td>Low <td>High <td>Low </td></td></td></td></td></td></td></td>	High <td>Low <td>High <td>Low <td>High <td>Low <td>High <td>Low </td></td></td></td></td></td></td>	Low <td>High <td>Low <td>High <td>Low <td>High <td>Low </td></td></td></td></td></td>	High <td>Low <td>High <td>Low <td>High <td>Low </td></td></td></td></td>	Low <td>High <td>Low <td>High <td>Low </td></td></td></td>	High <td>Low <td>High <td>Low </td></td></td>	Low <td>High <td>Low </td></td>	High <td>Low </td>	Low			
Issues Traded	1,975	3,060	2,048												
Rises	590	192	1,100												
Advances	964	1,187													
Unchanged	585	381	346												
New Highs	100	20	6												
TORONTO															
1986				1985				Since Comp'n							
Dec. 84	Dec. 83	Dec. 80	Dec. 78	Dec. 76	High	Low	High	Low	High	Low	High	Low			
Issues Traded	1,975	3,060	2,048												
Rises	590	192	1,100												
Advances	964	1,187													
Unchanged	585	381	346												
New Highs	100	20	6												
SWEDEN															
Jacobson & P. 11.58	c	c	1699.25	1716.25	1725.50	1612	1705.82	3.7							
SWITZERLAND															
Swiss Bank Corp. 21.52	c	c	547.2	561.4	582.2	531	588.7	5.1							
WORLD															
Capital Intl. 11.20	-	-	251.6	252.2	253.9	16.12	164.8	4.1							

## “What’s special about these Danish companies?”

ABN Bank Copenhagen Branch, Assurandør-Societetet, Barclays  
Finans A/S, Berlingske Tidende, Bilkuben, Boliden, Buch+Deichmann,  
Danish Steel Works Ltd., Danish Telecom International A/S, Danish  
Turnkey Dairies Ltd., Dannesbøg Shipyard Ltd., A/S De Danske  
Sukkerfabriker, Dorn A/S, Duracell-Daimon A/S, East Asiatic Co. Ltd.  
(A/S Det Østasiatiske Kompagni), A/S Elizabeth Arden, Ess-Food, F. L.  
Smidth & Co. A/S, Forlaget Management A/S, Friso Sol A/S, G. Grø-  
brand & Elektronik A/S, Grønnes Danmark A/S, Grundfos International  
A/S, Haldor Topsøe A/S, Hellerup Bank A/S, Henriques Bank  
Aktieselskab, Kredittoreningen Danmark A/S, Kommunedata,  
Midtbank, A/S Niro Abnørzer, Norsk Hydro Danmark a/s, Nykredit, Price  
Waterhouse, Privatbanken A/S, Revisionsfirmaet C. Jeppesen,  
Sclerandvisk Tølselskompagni, Statsanstalt for Lysforsikring, The  
Jutland Technological Institute, Aktieselskabet Varde Bank.

**They are all regular readers of the  
FINANCIAL TIMES • European Edition**

**For further information about subscription rates in Scandinavia,  
please contact Marianne Bang Nielsen in Copenhagen:**

**01-13 44 41**

**OVER-THE-COUNTER** *Nasdaq national market, 2.30pm prices*[illegible]


**Special Subscription**  
**HAND DELIVERY SERVICE**  
of the  
**FINANCIAL TIMES**  
EUROPE'S BUSINESS NEWSPAPER  
in  
**FRANCE**

For details of how you can obtain your subscription copy of the *Financial Times*, personally hand-delivered to your office in the locations indicated, contact:—  
Ben Hughes  
*Financial Times (France) Ltd*  
Centre d'Affaires Le Louvre  
168 rue de Rivoli 75044 Paris Cedex 01  
France Tel: 4297 0630 Telex: 220044

**Get your News early in Stuttgart**

Eine Zeitung erst mittags geliefert, hat für Sie nur den halben Wert.  
Damit Sie Ihre Financial Times noch vor Geschäftsbeginn erhalten, haben wir unseren Botendienst in Ihrer Stadt weiter verbessert.  
Einzelheiten erfahren Sie von Financial Times in Frankfurt.

**Rufen Sie die Abonnenten-  
Abteilung an.**  
Telefon: 069 7598-0  
The Financial Times  
(Europe) Ltd.  
Gnielienstraße 54  
6800 Frankfurt/Main

 For morning delivery of the FT  
in major business centers coast-to-coast,  
call 212-752-4500.

Hand delivery to home or office is available in Atlanta, Boston, Chicago, Dallas, Detroit, Miami, Minneapolis, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Seattle, San Francisco, Washington, Montreal, Ottawa, Toronto, Vancouver. Please call between 9am-6pm New York time.

11. புதிதானவர்கள் இவ் பக்கம்

## NEW YORK STOCK EXCHANGE COMPOSITE PRICES

**Continued on Page 2**

## NYSE COMPOSITE PRICES

12 Month	Low	Stock	Dr. Yld.	P/ E	100s	High	Div	Div Pct	12 Month	Low	Stock	Dr. Yld.	P/ E	100s	High	Div	Div Pct
Continued from Page 22																	
29%	16%	Prmkin	40	14.22	17	250	29%	28%	29%	13%	Sony Corp.	30	11.5	180	29%	28%	
30%	17%	Prmkin A-10	4.8	9	17	250	30%	29%	30%	13%	Sony Corp.	30	11.5	180	29%	28%	
31%	18%	Prmkin A-10	4.8	9	17	250	31%	29%	31%	13%	Sony Corp.	30	11.5	180	29%	28%	
32%	19%	Prmkin A-10	4.8	9	17	250	32%	29%	32%	13%	Sony Corp.	30	11.5	180	29%	28%	
33%	20%	Prmkin A-10	4.8	9	17	250	33%	29%	33%	13%	Sony Corp.	30	11.5	180	29%	28%	
34%	21%	Prmkin A-10	4.8	9	17	250	34%	29%	34%	13%	Sony Corp.	30	11.5	180	29%	28%	
35%	22%	Prmkin A-10	4.8	9	17	250	35%	29%	35%	13%	Sony Corp.	30	11.5	180	29%	28%	
36%	23%	Prmkin A-10	4.8	9	17	250	36%	29%	36%	13%	Sony Corp.	30	11.5	180	29%	28%	
37%	24%	Prmkin A-10	4.8	9	17	250	37%	29%	37%	13%	Sony Corp.	30	11.5	180	29%	28%	
38%	25%	Prmkin A-10	4.8	9	17	250	38%	29%	38%	13%	Sony Corp.	30	11.5	180	29%	28%	
39%	26%	Prmkin A-10	4.8	9	17	250	39%	29%	39%	13%	Sony Corp.	30	11.5	180	29%	28%	
40%	27%	Prmkin A-10	4.8	9	17	250	40%	29%	40%	13%	Sony Corp.	30	11.5	180	29%	28%	
41%	28%	Prmkin A-10	4.8	9	17	250	41%	29%	41%	13%	Sony Corp.	30	11.5	180	29%	28%	
42%	29%	Prmkin A-10	4.8	9	17	250	42%	29%	42%	13%	Sony Corp.	30	11.5	180	29%	28%	
43%	30%	Prmkin A-10	4.8	9	17	250	43%	29%	43%	13%	Sony Corp.	30	11.5	180	29%	28%	
44%	31%	Prmkin A-10	4.8	9	17	250	44%	29%	44%	13%	Sony Corp.	30	11.5	180	29%	28%	
45%	32%	Prmkin A-10	4.8	9	17	250	45%	29%	45%	13%	Sony Corp.	30	11.5	180	29%	28%	
46%	33%	Prmkin A-10	4.8	9	17	250	46%	29%	46%	13%	Sony Corp.	30	11.5	180	29%	28%	
47%	34%	Prmkin A-10	4.8	9	17	250	47%	29%	47%	13%	Sony Corp.	30	11.5	180	29%	28%	
48%	35%	Prmkin A-10	4.8	9	17	250	48%	29%	48%	13%	Sony Corp.	30	11.5	180	29%	28%	
49%	36%	Prmkin A-10	4.8	9	17	250	49%	29%	49%	13%	Sony Corp.	30	11.5	180	29%	28%	
50%	37%	Prmkin A-10	4.8	9	17	250	50%	29%	50%	13%	Sony Corp.	30	11.5	180	29%	28%	
51%	38%	Prmkin A-10	4.8	9	17	250	51%	29%	51%	13%	Sony Corp.	30	11.5	180	29%	28%	
52%	39%	Prmkin A-10	4.8	9	17	250	52%	29%	52%	13%	Sony Corp.	30	11.5	180	29%	28%	
53%	40%	Prmkin A-10	4.8	9	17	250	53%	29%	53%	13%	Sony Corp.	30	11.5	180	29%	28%	
54%	41%	Prmkin A-10	4.8	9	17	250	54%	29%	54%	13%	Sony Corp.	30	11.5	180	29%	28%	
55%	42%	Prmkin A-10	4.8	9	17	250	55%	29%	55%	13%	Sony Corp.	30	11.5	180	29%	28%	
56%	43%	Prmkin A-10	4.8	9	17	250	56%	29%	56%	13%	Sony Corp.	30	11.5	180	29%	28%	
57%	44%	Prmkin A-10	4.8	9	17	250	57%	29%	57%	13%	Sony Corp.	30					

## AMEX COMPOSITE PRICES

**Prices at 3pm, December 26**

Stack	Div	P	Sls	High	Low	Class	Change	Stack	Div	P	Sls	High	Low	Class	Change	Stack	Div	P	Sls	High	Low	Class	Change	Stack	Div	P	Sls	High	Low	Class	Change
			100s								100s								100s								100s				
Adcom	36	17	17	17	17	17		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
Adcom	36	17	17	17	17	17		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
Aeroc	50	50	4	4	4	4		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17	IMC/Gr	60	23	11	11	11	11		Reed A	10	12	100	47	47		
AmPy	60	52	51	51	51	51		Cubic	38	19	22	22	22	22	17</																

**OVER-THE-COUNTER** *Nasdaq national market, 2:30pm prices*

Sales (thous)					Stock					Sales (thous)					Stock					Sales (thous)					Stock				
High	Low	Last	Chg		High	Low	Last	Chg		High	Low	Last	Chg		High	Low	Last	Chg		High	Low	Last	Chg		High	Low	Last	Chg	
ADD	72	72	274	274	ChChn	471	8	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AFZ	262	262	262	262	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	142	14	14	14	14	14	14	14
AG	107	107	107	107	ChCpa	141	23	22	22	Frndg	176	93	65	65	100	100	100	100	100	Kay	36	1							

**Continued on Page 21**

**HOW TO ORDER THE FT FOR MORNING DELIVERY IN:**  
**Atlanta • Boston • Chicago • Dallas • Detroit • Miami • Houston**  
**• Los Angeles • New York • Philadelphia • Pittsburgh •**  
**San Francisco • Washington • Montreal • Ottawa • Toronto**

Call the Financial Times direct: 212-752-4500.  
From 9am to 6pm New York time. Ask for Subscription Service.

**FINANCIAL TIMES**  
14 East 60th Street, New York, NY 10022.

